



Administrator's Guide

General

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IMPORTANT!

**Please Read Safety Notice on Page 99
before using the iR1200 Modem.**

Last Updated
RFM-4002-5015 Rev 3
November 2003

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FCC Compliance

DECLARATION OF CONFORMITY

Per FCC CFR 47 2.989



Responsible party name: eLutions, Inc.
Address: 5905 Breckenridge Parkway
Suite F
Tampa, FL 33610
Phone number: 1-800-836-9909

Hereby declares that the product:

Product name: iR1200 GPS-Enabled Modem
Model Number: 4000-C5-RFM

Product name: iR1200 Rugged Modem
Model Number: 4100-C5-RFM

Conforms to the following regulation:

FCC Part 15, subpart B
FCC Part 90, subpart S
Class B Digital device

Date: May 16, 2003

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 and 90 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference or by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Required Components

The following table lists components that have been approved for use with the iR1200 Rugged Modem and iR1200 GPS-Enabled modems.

Part No.	Description
5000-C5-RFM	Magnetic Mount Cellular Antenna
5010-C5-RFM	Magnetic Mount Cellular Antenna (spring wire)
5020-C5-RFM	Direct Mount Cellular Antenna
5030-C5-RFM	Magnetic Mount GPS Antenna
5040-C5-RFM	Fixed Mount Cellular Antenna (spring wire)
5050-C5-RFM	Dual Fixed Mount Cellular/GPS Antenna
5060-C5-RFM	Dual Covert Mount Cellular/GPS Antenna
5100-C5-RFM	Vehicle Power Harness
5200-C5-RFM	AC Power Adapter (standard temperature)

How to Order

To obtain any of the items listed above, please contact your Nextel sales representative or visit www.elutions.com/wireless.

Online Documentation

The iR1200 modem is shipped with the following product documentation. Additional copies of these documents can be downloaded (at no charge) online at www.elutions.com/wireless or calling 1-888-349-4338.

Part No.	Description
RFM-4000-5015	Installation Guide
RFM-4001-5015	Quick Reference Guide
RFM-4003-5015	Warranty Card/Installation and Usage Requirements

Introduction

Welcome to Nextel®

Thank you for purchasing the Nextel iR1200 modem. This modem works on the iDEN® network. Once installed and configured, the iR1200 modem provides users with wireless data communications.

This chapter includes:

Using This Guide	Page 7
Nextel® Coverage	Page 7
Nextel® Customer Care Information	Page 8

Using This Guide

This guide provides instructions for installing the iR1200 Rugged Modem and the iR1200 GPS-Enabled Modem.

Nextel® Coverage

For details on Nextel digital cellular and data coverage, visit nextel.com.

NOTE: Transmission and reception speed may vary, based on your relative position within the coverage area. If you are in a marginal location (close to the border of the coverage area), the throughput of your modem during data transmission may be affected.

Nextel® Customer Care

For customer care issues including technical support contact Nextel Customer Care at 1-800-639-6111.

When you call, please have a detailed description of your problem. To provide you with fast and quality support, our Customer Care representative may ask for information on the following:

- Computer operating system (Windows 95/98/NT/2000/CE)
- Version of the operating system (e.g. NT 4, Windows 95 Version B, CE 2.1, etc.)
- Information regarding the modem (most can found on the diagnostic menu)
- Geographic location of use
- Extended Error Result Codes

Overview

This chapter provides general details about the iR1200 modem.

This chapter includes:

General Overview	Page 9
Modem Operating Modes	Page 10
Modem Configurations	Page 10
Modem Specifications	Page 12

General Overview

The iR1200 Modem is an iDEN[®] data modem consisting of a modem card and an optional GPS (iR12000 GPS-Enabled Modem) receiver, contained in a rugged enclosure, to provide wireless data communications. The iR1200 modem is easy to mount, whether in a mobile or a fixed environment.



Figure 1. iR1200 GPS-Enabled Modem

Modem Operating Modes

The iR1200 provides the following data connection modes:

- **Packet Data:** A wireless modem connection used for accessing the Internet, sending and receiving e-mail, and transferring small files over the packet data network using standard IP protocols.

Data is sent in packets (blocks) at high speed.

- **Circuit Switched Data:** A wireless modem connection for sending and receiving data (faxes, files, etc.) over the circuit-switched cellular channel, providing a direct point-to-point connection with the destination device.

Modem Configurations

Nextel offers two models of the iR1200 Modem. While both are designed to provide wireless communication for rugged environments, one model offers GPS capability as well.

The iR1200 modem can be purchased with the following configurations:

- **iR1200 Rugged Modem (Base Model)** - Available in bulk or individual packaging
- **iR1200 GPS-Enabled Modem** - Available in bulk or individual packaging

iR1200 Rugged Modem

The following diagram displays the components on the rear panel of the iR1200 Rugged Modem.

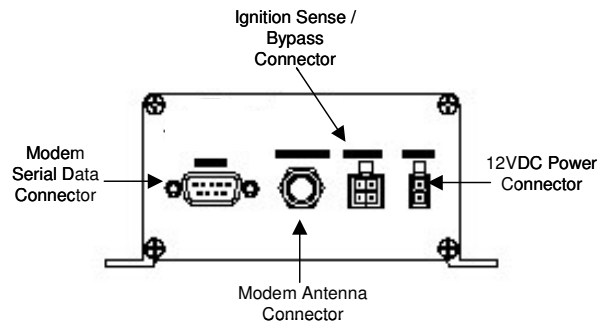


Figure 2. Rear Panel of iR1200 Rugged Modem

iR1200 GPS-Enabled Modem

The following diagram displays components on the rear panel of the iR1200 GPS-Enabled Modem.

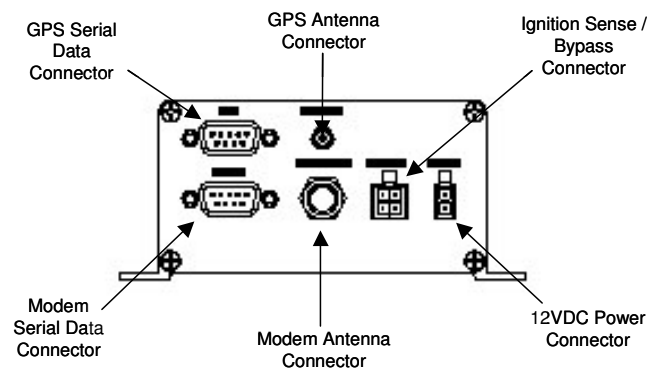


Figure 3. Rear Panel of iR1200 GPS-Enabled Modem

Modem Specifications

Transmission Modes	Circuit-Switched, Packet Data & Hayes AT Commands
Rugged metal enclosure	Extruded Aluminum
Status monitoring LED	One bi-color LED for operating status
External Modem Software	User to utilize Windows drivers
Internal Modem Software	Micro controller firmware
Radio Frequency	Tx 806-821 MHz Rx 851-866 MHz
TX Output Power	0.6 W at 25 degrees C
Static Sensitivity	-111dbm @ -10% BER
Input Voltage	12VDC nominal, 10 to 16 VDC operating range
Current Consumption	0.1 Amps average, 1.5 Amps peak
Dimensions	Approximately 5.04"W x 2.21"H x 7"D
Weight	Approximately 625 grams
Data Connector	DB-9 for modem, DB-9 for GPS (optional)
Power Connector	Molex 39-01-2020 with 39-00-0186 pins
Ignition Connector	Molex 39-01-2040 with 39-00-0186 pins
Operating Temperature	-25 degrees C to +60 degrees C
Storage Temperature	-40 degrees C to +85 degrees C
Humidity	0-95% non-condensing

Overview

Vibration	per TIA/EIA 603 par 3.3.4
Shock	per MIL-STD-810E, method 516.4, procedure I
Dust/Water Resistance	Dust per MIL-STD-810E, method 510.3, procedure I Water per MIL-STD-810E, method 506.3, procedure II
External Reset Button (RF & Master reset)	Yes
External LED Lights/Indicators	6 Single color LEDs for modem RS-232 signal status (TX, RX DR, DSR, CTS, RTS per RS-232-C/E Specifications)
GPS Receiver	8 channel, NMEA 0183 protocol
External Antenna Connectors	Mini UHF female for modem and MCX female for GPS
Power Requirements	Yes, Ignition sense, 6'-20' range Yes, 5 sec power-off delay from loss of ignition (12V still available)
Internal monitoring with self-reset capability	Yes, field support diagnostic screen provided and self-reset

Getting Started

This chapter describes how to connect your modem to a computer or mobile device in preparation for the configuration process.

This chapter includes:

Connecting the Modem	Page 15
Communication Indicators	Page 17

Connecting the Modem

The following table describes how to connect the modem to the computer using the RS-232 cable.

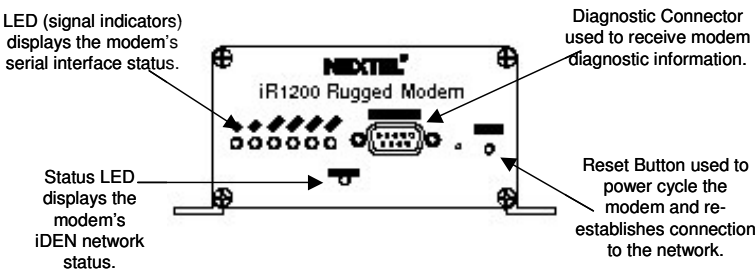


Figure 4 – Front Panel View of the iR1200 Modem

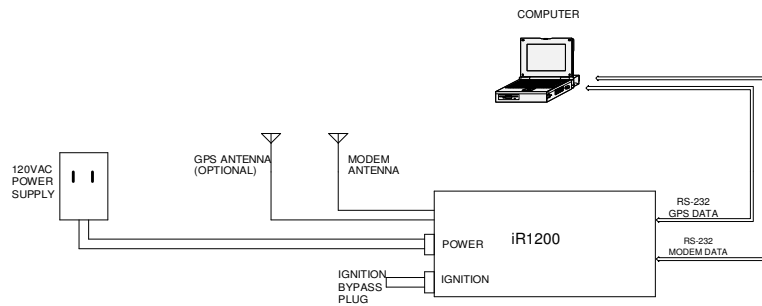


Figure 5 – Cabling Diagram (Fixed Environment)

NOTE: DCE (data communication equipment) refers to your iR1200 Modem
DTE (data terminal equipment) refers to your computer or mobile device.

- | | |
|----------|---|
| 1 | Make sure that there is no power being supplied to the modem (unplug the ignition bypass plug or power connector – refer to Figure 5 – Cabling Diagram above). |
| 2 | Connect the DB-9-P (male) connector on the cable to the DB-9-S (female) to the connector DCE (labeled Diagnostic on the modem's front panel –refer to Figure 4 on page 15). |
| 3 | Connect the DB-9-P connector on the cable to the DB-9-S connector on the DTE. |
| 4 | Connect the modem antenna cable to the connector labeled MODEM antenna on the rear panel of the modem (refer to Figures 2 and 3 on page 11). |

5	Plug the AC power cord into the 2-prong polarized power jack located on the rear panel of the modem. Plug the other end into a 120VAC-wall outlet.
6	Insert the ignition bypass plug into the 4-prong polarized IGNITION jack located on the rear panel of the modem (refer to Figures 2 and 3 on page 11).
7	The STATUS Led light will be solid RED. This indicates that the modem is attempting to register with the iDEN network.
8	A blinking green light indicates that the modem has successfully registered with the iDEN network.

Communication Indicators

Your iR1200 modem is equipped with the LED indicators (located on the front panel of the modem – see Figure 4) that identify various communication functions.

The following table contains descriptions of the LED indicators and their functions.

Signal	Color	Indication
Tx	Blinking Green	Modem is transmitting data to the computer data terminal (DTE).
Rx	Blinking Green	Modem is receiving data from the computer. Modem is receiving data from the DTE.
RTS	Green (Off)	Request To Send from computer (DTE) is asserted (not asserted).

Signal	Color	Indication
CTS	Green (Off)	Clear To Send from modem is asserted (not asserted).
DTR	Green (Off)	Data terminal equipment is ready (not ready).
DSR	Green (Off)	Modem is ready (not ready).
STATUS	Solid Red	<p>The modem is searching for a signal within the Nextel network. If the modem status changes from blinking green back to solid red, the signal has been lost and the modem is attempting to re-acquire.</p> <p>NOTE: If after several minutes the status does not return to green, you may be out of range. The modem will attempt to re-acquire automatically when you are back in range.</p>

**NOTE: The STATUS indicators are different depending on the mode
in which the modem is operating.**

The following tables describe the STATUS indicators for the Packet Data and Circuit Switched Data operating modes.

Packet Data

STATUS	Blinking Green	In-range (modem is connected to the Nextel network) but idle (but not passing data).
STATUS	Blinking Green	The modem is in use – Nextel network communication is active and is passing data.

Circuit Switched Data

STATUS	Blinking Green	In-range (modem is connected to the Nextel network) but idle (but not passing data).
STATUS	Solid Green	The modem is in use – Nextel network communication is active and is passing data.

Installing iDEN® Packet Data Applet

In this chapter, you will learn how to install the iDEN® Packet Data Applet. The applet enables connectivity for the iR1200 modem connected to a laptop or mobile device and allows you to monitor the service and modem status such as signal strength.

This chapter includes:

Hardware and Installation Requirements	Page 21
Before You Begin	Page 22
Download and Installation Instructions	Page 22
Instructions for Windows 95/98/ME	Page 23
Instructions for Windows NT	Page 26
Instructions for Windows 2000	Page 31

Hardware and Installation Requirements

To run the installation program, you will need the following:

- An IBM® compatible PC with:
 - 586 (or higher) processor
 - Microsoft® Windows 95, 98, NT or 2000, XP
 - Minimum 8 MB of addressable RAM
 - 3 MB free hard-disk space
 - Recommended: Mouse or compatible pointing device
- Communication software
- Standard Internet browser (such as Internet Explorer or Netscape)
- An active account with Nextel (for connection to the iDEN® network)

NOTE: Please check the Nextel.com website for the latest hardware and installation requirements.

Before You Begin

Windows must have a Dial-up Networking Version 1.3 or later and the TCP/IP protocol Installed.

NOTE: If the version of your Dial-up Networking is earlier than v1.3, please go to www.microsoft.com to obtain an upgrade.



Before proceeding, please check that your computer has a network card or security program that prevents IP address changes.

- Windows Dial-Up Networking version 1.3 or higher installed (refer to the “Manual Modem Configuration” chapter in this guide for installation instructions)
- TCP/IP installed (refer to the “Setup Windows Components” chapter in this guide for installation instructions)
- Dial-Up Adapter installed (refer to the “Setup Windows Components” chapter in this guide for installation instructions)

Download Software Instructions

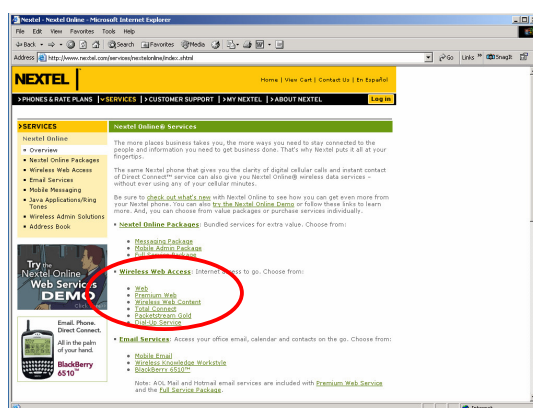
This software configures your computer to receive Packet Data services. It also monitors the service and provides service status information such as battery status and signal strength.

NOTE: Windows NT and 2000 users will need administrator rights to complete the installation.

The following table describes steps to download and install the iDEN® data packet applet.

Windows 95/98/ME

- 1 Access the **Nextel website** by entering **www.nextel.com**. From the **Nextel Home Page**, select **Services→Nextel Online**. The **Nextel Online Services** page appears.



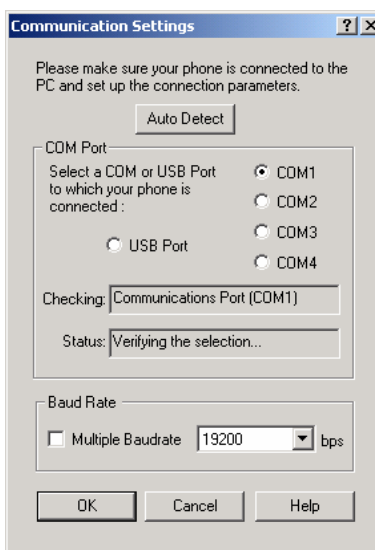
- 2 From the **Nextel Online** page, find and select **Wireless Web Access→PacketstreamGold**.
- 3 The **Packetstream Gold Service** page appears.
- 4 Click the **Download Packetstream Gold Software (PC Only)** link. The **Download Packetstream Gold Software** page appears.
- 5 Scroll down the page to find and select either **Nextel Online Packetstream Gold Service Install** link or the **Download Now** link located that the bottom of the page.
- 6 The download program will copy the files that are needed to install the software to the appropriate location on your

	computer. IMPORTANT: When you have finished downloading the program, you MUST connect the data cable to your modem and computer before proceeding further.
7	Find the program in the appropriate folder and double-click the Setup.exe to launch the program to initiate the installation process. NOTE: The setup.exe will be contained in a zip or compressed file.
8	Click Next to accept the default Program Folder, iDEN Data Modem Applet . The installation program starts, a status window opens while the files are copying.
9	The Installshield Wizard screen appears during the setup process.
10	Click Next on the iDEN Packet Data Applet Setup screen.
11	The iDEN License Agreement screen appears. Select Yes to accept the terms of the agreement and proceed with the installation.
12	The Customer Information window opens. Enter your name and company then click Next .
13	The Choose Destination Location window opens. Click Next to accept the default destination folder, C:\Program Files .
14	The Select Program Folder window opens. Click Next to accept the default program folder, iDEN Packet Data Applet .
15	After the files are copied, the Question window opens. Click Yes to add a shortcut to your taskbar then click OK to continue.

16 Click **OK** to the message stating that you “must maximize the ‘Communication Settings’ window...”.

17 Click **Communication Settings** on your taskbar to maximize the window. The **Communication Settings** window opens.

NOTE: Check to make sure that your modem is turned on and connected to your computer before continuing with the installation.



18 Select the following value on the **Communication Settings** window:

- Click the **Auto Detect** to have the software automatically check for the COM Port or select the appropriate COM Port (typically **COM1**)
- **Multiple Baudrate** should be **unchecked**
- **Baud Rate: 19200 (bps)**

The program will check the communication settings and attempt

to connect to the modem.

19 The Packet Data Configuration window opens. Select No, I would like to configure my modem later or my modem has already been configured then click Next.

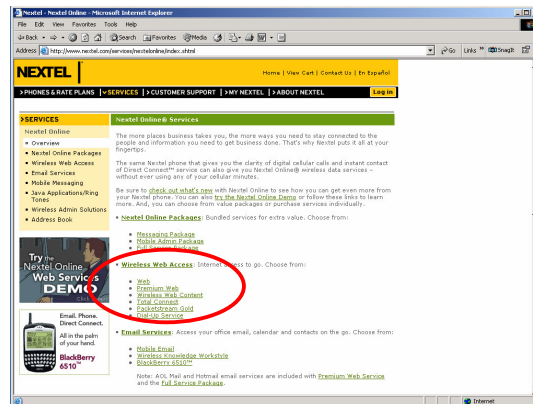
20 The Installation Complete window opens. Select Finish on the following screens to complete the installation process.

21 The Setup Complete window opens. Click Finish.

Windows NT

NOTE: Administrative rights are required to install the software on Windows NT. Contact your IT Representative or Systems Administrator for assistance.

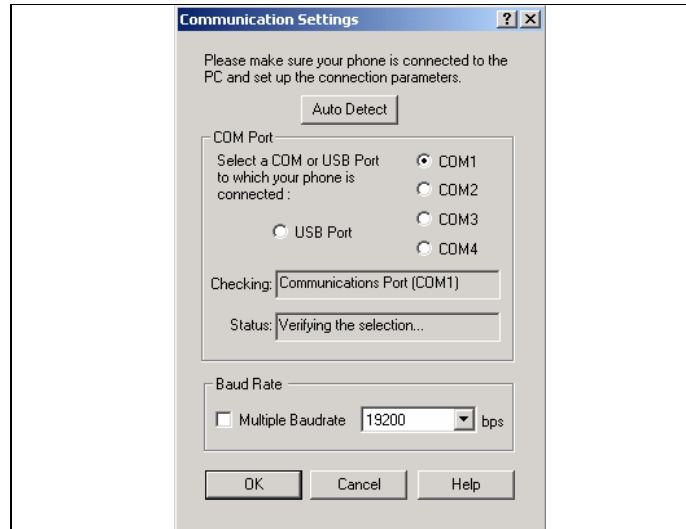
1 Access the Nextel website by entering www.nextel.com. From the Nextel Home Page, select Services→Nextel Online. The Nextel Online Services page appears.



2	From the Nextel Online page, find and select Wireless Web Access→PacketstreamGold .
3	The Packetstream Gold Service page appears.
4	Click the Download Packetstream Gold Software (PC Only) link. The Download Packetstream Gold Software page appears.
5	Scroll down the page to find and select either Nextel Online Packetstream Gold Service Install link or the Download Now link located at the bottom of the page.
6	The download program will copy the files that are needed to install the software to the appropriate location on your computer. IMPORTANT: When you have finished downloading the program, you MUST connect the data cable to your modem and computer before proceeding further.
7	Find the program in the appropriate folder and double-click the Setup.exe to launch the program to initiate the installation process. NOTE: The setup.exe will be contained in a zip or compressed file.
8	Click Next to accept the default Program Folder, iDEN Data Modem Applet . The installation program starts, a status window opens while the files are copying.
9	The Installshield Wizard screen appears during the setup process.
10	Click Next on the iDEN Packet Data Applet Setup screen.
11	The iDEN License Agreement screen appears. Select Yes to accept the terms of the agreement and proceed with the installation.
12	The Customer Information window opens. Enter your name and company then click Next .

13	The Choose Destination Location window opens. Click Next to accept the default destination folder, C:\Program Files .
14	The Select Program Folder window opens. Click Next to accept the default program folder, iDEN Packet Data Applet .
15	After the files are copied, the Question window opens. Click Yes to add a shortcut to your taskbar then click OK to continue.
16	An additional Information window opens. Click OK to continue with the installation.
17	The Add/Remove Hardware window opens. Click the Don't Detect my modem; I will select it from a list of checkbox then click Next .
18	The Modem Selection window opens. From Manufacturers list box, locate and select Motorola and Motorola iDEN plus Series then click Next .
19	The Port Selection window opens. Highlight the COM port that your modem is connected and click Next .
20	The Modem Installation Finish window opens. Click Finish .
21	The Information window opens indicating that you need to add the modem to the RAS manager and reboot the computer. Click OK to continue.
22	The Network Configuration window opens. Select the Services tab.
23	The Network Services Selection window opens. Highlight the Remove Access Service and click Properties .

24	The Remove Access Service window opens. Click Add .
25	The RAS Device window opens. Verify that the correct COM port is displayed in the RAS Capable Device box then click OK . NOTE: If the Motorola iDEN® plus Series modem is not displayed in the RAS Capable Device box, click the Install Modem button to install the modem again.
26	The Remote Access Setup window now displays the added COM port.
27	From the Remote Access Setup window, highlight the COM port/Device that was just added and click Configure . The Configure Port Usage window opens. Click on the Dial out only radio button then click OK .
28	The Remote Access Setup window opens. Click Continue .
29	Click Close to the Network Services Selection window.
30	Click Finish on the iDEN Packet Data Applet Setup window.
31	The Network Settings change/Computer Restart window opens. Click Yes .
32	The Installshield Wizard window will appear once Windows has completed the restart process. Click Reinstall Packet Data Applet icon to proceed with the installation.
	NOTE: Check to make sure that your modem is turned on and connected to your computer before continuing with the installation.



33 Select the following value on the **Communication Settings** window:

- Click the **Auto Detect** to have the software automatically check for the COM Port or select the appropriate COM Port (typically **COM1**)
- **Multiple Baudrate** should be **unchecked**
- **Baud Rate: 19200 (bps)**

The program will check the communication settings and attempt to connect to the modem.

34 The **Packet Data Configuration** window opens. Select **No, I would like to configure my modem later or my modem has already been configured** then click **Next**.

35 The **Installation Complete** window opens. Select **Finish** on the following screens to complete the installation

process.
36 The Setup Complete window opens. Click Finish .

Windows 2000

NOTE: Administrative rights are required to install the software on Windows 2000. Contact your IT Representative or Systems Administrator for assistance.

1	Access the Nextel website by entering www.nextel.com . From the Nextel Home Page , select Services→Nextel Online . The Nextel Online Service Page appears.
2	From the Nextel Online page , find and select Wireless Web Access→PacketstreamGold .
3	The Packetstream Gold Service page appears.
4	Click the Download Packetstream Gold Software (PC Only) link. The Download Packetstream Gold Software page appears.
5	Scroll down the page to find and select either Nextel Online Packetstream Gold Service Install link or the Download Now link located at the bottom of the page.
6	The download program will copy the files that are needed to install the software to the appropriate location on your computer. IMPORTANT: When you have finished downloading the program, you MUST connect the data cable to your modem and computer before proceeding further.
7	Find the program in the appropriate folder and double-click the Setup.exe to launch the program to initiate the installation process. NOTE: The setup.exe will be contained in a zip or compressed file.
8	Click Next to accept the default Program Folder, iDEN Data Modem Applet . The installation program starts and, a

	status window opens while the files are copying.
9	The Installshield Wizard screen appears during the setup process.
10	Click Next on the iDEN Packet Data Applet Setup screen.
11	The iDEN License Agreement screen appears. Select Yes to accept the terms of the agreement and proceed with the installation.
12	The iDEN Packet Data Applet Setup window will prompt you to enter a Username and Company. Enter the appropriate information and click Next .
13	The Select Program Folder window opens and you are asked to name the destination folder, click Next to accept the default.
14	After the files are copied, the Question window opens. You will be asked if you would like to add the shortcut to your Windows desktop. Select Yes to add the shortcut
15	The Information window opens. Click Yes to begin installing.
16	An additional Information window opens. Click OK .
17	The Phone and Modem Options window opens with the Modems tab selected. Click Add .
18	The Add/Remove Hardware window opens. Click the Don't Detect my modem; I will select it from a list of checkbox then click Next .
19	The Modem Selection window opens. From Manufacturers list box, locate and select Motorola and Motorola iDEN plus Series then click Next .
20	The Port Selection window opens. Highlight the COM port

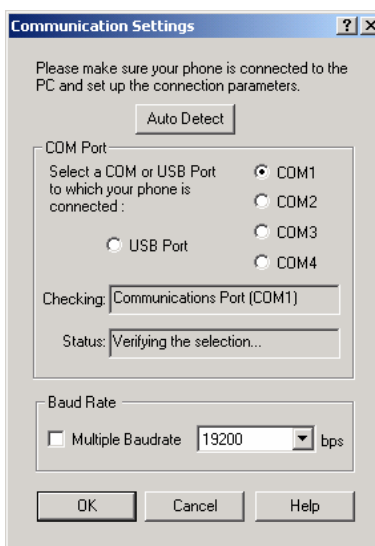
that your modem is connected and click **Next**.

21 The **Digital Signature Not Found** window opens. Click **Yes** to continue the installation.

22 The **Modem Installation Finish** window opens. Click **Finish**.

23 The **Phone and Modem Options** window reopens with the **Modems** tab selected. Verify that the **Motorola iDEN plus Series** modem appears on the list. Click **OK**.

NOTE: Check to make sure that your modem is turned on and connected to your computer before continuing with the installation.



24 Select the following value on the **Communication Settings** window:

- Click the **Auto Detect** to have the software automatically check for the COM Port or select the

appropriate COM Port (typically **COM1**)

- **Multiple Baudrate** should be **unchecked**
- **Baud Rate: 19200 (bps)**

The program will check the communication settings and attempt to connect to the modem.

25 The **Packet Data Configuration** window opens. Select **No, I would like to configure my modem later or my modem has already been configured** then click **Next**.

26 The **Installation Complete** window opens. Select **Finish** on the following screens to complete the installation process.

27 The **Setup Complete** window opens. Click **Finish**.

Setting Up Windows Components

In this chapter, you will learn how to set up Windows components and verify their installation.

This chapter includes:

Verifying Dial-Up Networking	Page 35
Verify TCP/IP Installation	Page 36
Install Dial-Up Adapter	Page 39

Verify Dial-Up Networking

This section describes the procedures for verifying dial-up networking on your Windows computer.



If it is determined that your computer does not have dial-up networking, please proceed to the “Manual Modem Configuration” for instructions on how to install dial-up networking.

Windows 95/98/ME

- 1 From your desktop, double-click the **My Computer** icon to open the **My Computer** window.
- 2 Double-click the **Dial-Up Networking** icon to open the **Dial-Up Networking** window.
- 3 Double-click the **Make New Connection** icon. The **Make New Connection** window should appear, indicating that dial-up networking is installed.
- 4 Click **Cancel** to close the **Make New Connection** window.

Windows NT

1	From your desktop, double-click the My Computer icon to open the My Computer window.
2	Double-click the Dial-Up Networking icon to open the Dial-Up Networking window.
3	The Dial-Up Networking window opens and displays the Phone book entry to dial heading. If the Dial-Up Networking window displays the Install prompt then dial-up networking has not been installed.
4	Click Close to close the Dial-Up Networking window.

Windows 2000

1	From your desktop, double-click the My Computer icon to open the My Computer window.
2	Double-click the Control Panel icon. The Control Panel window opens.
3	Double-click the Networking and Dial-Up Connections icon. The Make New Connection window should appear, indicating that dial-up networking is installed.
4	Click Close to close the Network and Dial-up Connections window.

Verify TCP/IP Protocol Installation

The following table describes the steps for verifying TCP/IP Protocol and Dial-up Adapter.

Windows 95/98/ME

1	From your desktop, double-click the My Computer icon to open the My Computer window.
2	Double-click the Control Panel icon to open the Control Panel window.
3	Double-click the Network icon to open the Network window.
4	<p>Scroll down the list to find TCP/IP Dial-Up Adapter.</p> <ul style="list-style-type: none"> If you see TCP/IP→Dial-Up Adapter in the list, click OK; you have TCP/IP installed and can proceed with installation. If you do not see TCP/IP→Dial-Up Adapter in the list, you will need to add the TCP/IP protocol. Click Add and proceed with the remaining instructions.
5	The Select Network Component Type window opens. Highlight Protocol and then click Add .
6	The Select Network Protocol window opens. Under Manufacturer , select Microsoft . Under Network Protocol , select TCP/IP . Click OK .
7	<p>The TCP/IP Dial-Up Adapter appears in the list.</p> <ul style="list-style-type: none"> If the Dial-Up Adapter appears in the Network Adapters list, it is installed. You may proceed with installation. If the Dial-Up Adapter does not appear in the Network Adapters list, you do not have a Dial-Up Adapter installed. Refer to page 38 for instructions for installing Dial-Up adapter.
8	Click OK to close the Select Network Protocol window.

Windows NT/2000

In most cases the TCP/IP protocol was installed automatically. However, for Windows NT and 2000, TCP/IP may not have been included in the standard installation. The following steps describe how to check that TCP/IP is in fact installed, and if necessary add the TCP/IP protocol.

NOTE: This may require that you contact your IT Representative or System Administrator.

1	From your desktop, select Start→Settings→Network and Dialup Connections→Local Area Connection . The Local Area Connection window opens.
2	Click the Properties button on the Local Area Connection window.
3	Is the Internet Protocol listed under the Components listing?
4	If the Internet Protocol is not listed, click the Install button. The Select Network Component Type window opens.
5	Under Network Component Type listing, highlight Protocol and click Add .
6	The Select Network Protocol window opens. Under Network Protocol listing, highlight Internet Protocol and click OK .
7	The installation will now begin — if prompted do NOT restart.

Installing the Dial-Up Adapter

The following table describes the steps for installing the Dial-Up Adapter.

Windows 95/98/ME

1	From the Select Network Adapter window, highlight Dial-Up Adapter in the Network Adapters list.
2	Under Manufacturers , highlight Microsoft . Click OK .
3	The Select Network Component Type window opens. Highlight Adapter . Click Add .
4	The Select Network Adapters window opens.
5	To verify that the adapter was added, from Start , select Settings . <ul style="list-style-type: none">• Select Control Panel.• Click Network.• Look for Dial-Up Adapter on the Network Configuration screen.

Windows NT/2000

The Dial-Up Adapter may not have been included in the standard installation. The following steps describe how to check that TCP/IP is in fact installed, and if necessary add the TCP/IP protocol.

NOTE: This may require that you contact your IT Representative or System Administrator.

1	Select Start→Settings→Control Panel . The Control Panel window opens. Double click on Network and Dial Up Connections .
2	The Network and Dial Up Connections window opens. Double click on Make New Connection which brings up

	the connection wizard. Click Next .
3	Select I want to set up my Internet connection manually as above, then click on Next .
4	Select I connect through a phone line and a modem then click on Next .
5	Enter the new phone number: <ul style="list-style-type: none">• Packet Data enter: s=2• Circuit Switched enter: ISP Phone Number Click on the Advanced button.
6	The Advance Connection Properties window opens. On the Connection tab, select PPP and for Logon procedure select None .
7	Click on the Addresses tab. Select My ISP automatically provides... Click on OK to return to the phone number screen. Click on Next to continue.
8	Enter your username and password then click Next .
9	Enter a connection name such as “ iR1200 Modem ” or “ IDEN Connection ” and then click Next .
10	Select No and click Next . Click on Finish to complete the setup.

Manual Modem Configuration

In this chapter, you will learn how to manually add a modem, configure the modem drivers and create a dial-up networking connection for Nextel.

NOTE: Use these instructions only if you did not previously install the iDEN® Packet Data Applet.

This chapter includes:

Modem Configuration – Windows 95/98/ME	Page 41
Modem Configuration – Windows NT 4.0	Page 44
Modem Configuration – Windows 2000	Page 48

Modem Configuration – Windows 95/98/ME

Install the Modem

1	Go to Start→ Settings→ Control Panel and click on the Modems icon.
2	The Modem Properties window opens. Select the General tab and click Add .
3	The Install New Modem window opens. Select Other . Click Next .
4	The Install New Modem/Hardware Installation window opens. Check the Don't run the Hardware Installation Wizard box. Click Next . NOTE: If this option is not available, proceed to the next step.
5	The Install New Modem/Modem Detection window opens. Check the Don't detect my modem; I will select

	from a list box. Click Next .
6	The Install New Modem/Modem Selection window opens. Under Manufacturer , select Standard Modem Types . Under Models , click Standard 19200 bps Modem . Click Next .
7	Select the COM port that you will be using to connect to the modem (i.e., COM1, COM2, or COM3), then click Next . NOTE: If you are not sure which COM port to use, begin with COM1. If you are unable to connect to a network using COM1, you will need to reinstall the modem after attaching the modem to a different COM port.
8	The Install New Modem/Modem Installation Finish window opens. Click Finish .
9	Continue with the steps to <i>Configure the Modem Driver</i> .

Configure the Modem Driver

1	From the Modems Properties window, select Standard 19200 bps Modem . Click Properties .
2	The Standard 19200 bps Modems Properties window opens. On the General tab, confirm the Maximum Speed is 19200 bps .
3	Click the Connection tab and verify the following settings: <ul style="list-style-type: none">• Data Bits: 8• Parity: None• Stop Bits: 1 Click Advanced .
4	The Advanced Connection Settings window opens. If they are not selected already, select the following:

	<ul style="list-style-type: none"> • Use Flow Control and • Hardware (RTS/CTS) • If the Duplex option is present, select Full.
5	Click OK to close the Advanced Connection Settings window.
6	Click OK (or Close) to close the Standard 19200 bps Modem's Properties window.
7	Click Close to close the Modem's Properties window.
8	Click Close to close the Control Panel .
9	Continue with the steps to <i>Create a Dial-Up Networking Connection</i> .

Create a Dial-up Networking Connection

1	With the My Computer window open, double-click the Dial-Up Networking icon.
2	The Dial-Up Networking window opens. Double-click Make New Connection .
3	The Make New Connection window opens. Enter a name for the connection, such as iR1200 Modem . Under Select a device , use the drop-down box to locate and select Standard 19200 bps Modems . Click Next .
4	<p>The Make New Connection window changes and now displays fields for entering the phone number. Delete any information contained in the Area Code box.</p> <ul style="list-style-type: none"> • For Packet Data: At Telephone number, enter s=2. • For Circuit Switched Data: Enter the ISP phone number. <p>Click Next.</p>
5	The Setup Finish window opens, click Finish . This

	procedure creates the iR1200 Modem icon in the Dial-Up Networking window.
6	In the Dial-Up Networking window, right click iR1200 Modem . Click Properties .
7	The iR1200 Modem Network window opens. Click the Server Types tab. NOTE: For packet data, country code and area code (under the General Tab) should always be blank to allow s=2 to be the telephone number.
8	Under Type of Dial-Up Server , select PPP . Under Allowed Network Protocols , ensure that the box next to TCP/IP is checked. Remove the check marks from all other selection boxes. Click the TCP/IP button.
9	The TCP/IP Settings window opens. Ensure that the following are checked: <ul style="list-style-type: none">• Server assigned IP address• Server assigned name server addresses• Use IP header compression• Use default gateway on remote network All other boxes should remain unchecked. Click OK .
10	Click OK to complete the set up

Modem Configuration – Windows NT

Install the Modem

1	Go to Start→ Settings→ Control Panel and click on the Modems icon.
----------	--

2	The Modems Properties window opens. Under the General tab click Add .
3	The Install New Modem window opens. Select Other then Next .
4	The Install New Modem/Hardware Installation window opens. Check the Don't run the Hardware Installation Wizard box. Click the Next button. NOTE: If this option is not present, proceed to the next instruction.
5	The Install New Modem/Modem Detection window opens. Check the Don't detect my modem; I will select it from a list box. Click Next .
6	The Install New Modem/Modem Selection window opens. Under Manufacturer , select (Standard Modem Types) . Under Models , click Standard 19200 bps Modem . Click Next .
7	The Port Selection window opens. Highlight the COM port that you will be using to connect to the phone. Click Next .
8	The Modem Installation Finish window opens. Click Finish .
9	The Modems Properties window reappears with the newly added Standard 19200 bps modem displayed in the dialog box. Click Close .
10	The following message appears: Dial-Up Networking needs to be configured because the list has changed. Do you wish to reconfigure? Click Yes .
11	The Remote Access Setup window opens. Click Add . NOTE: In Windows NT, only one modem can be installed per COM port. If you are attempting to install the Standard 19200 bps modem on a COM port to which another modem is directed, you must choose an alternate COM port or remove the other modem before proceeding. Otherwise a conflict will

occur and Windows NT will not recognize the Standard 19200 bps modem.	
12	The Add RAS Device window opens. Make sure the proper COM port for your modem connection is selected. Click OK .
13	The Remote Access Setup window now shows the added COM port. Click Continue .
14	The system automatically configures the appropriate settings.
15	Continue with the steps to <i>Configure the Modem Driver</i> .

Configure the Modem Driver

1	From the Modems Properties window, select the Standard 19200 bps Modem . Click Properties .
2	The Standard 19200 bps Modems Properties window opens. On the General tab, confirm the Maximum Speed is 19200 bps.
3	Click the Connection tab and verify the following settings: <ul style="list-style-type: none">• Data Bits: 8• Parity: None• Stop Bits: 1 Click Advanced .
4	The Advanced Connection Settings window opens. If they are not selected already, select the following: <ul style="list-style-type: none">• Use Flow Control and• Hardware (RTS/CTS)• If the Duplex option is present, select Full.

5	Click OK to close the Advanced Connection Settings window.
6	Click OK (or Close) to close the Standard 19200 bps Modems Properties window.
7	Click Close to close the Modem's Properties window.
8	Click Close to close the Control Panel .
9	Continue with the steps to <i>Create a Dial-Up Networking Connection</i> .

Create a Dial-up Networking Connection

1	With the My Computer window open, double-click the Dial-Up Networking icon.
2	The Dial-Up Networking window opens. Click New .
3	The New Phonebook Entry Wizard window opens. Enter a name for the phonebook entry such as <i>iR1200 Modem</i> . Click Next .
4	The Server window opens. Check the box next to I am calling the Internet . Click Next .
5	The Modem or Adapter window opens. Select the Standard 19200 bps Modem . Click Next .
6	The Phone Number window opens. In the Phone number box, enter the following: <ul style="list-style-type: none"> For Packet Data: s=2 For Circuit Switched Cellular: ISP Phone Number. Click Next .
7	The Wizard Finish window opens. Click Finish .
8	The Dial-Up Networking Phonebook window opens with the iR1200 Modem entry displayed. Click More and select

	Edit entry and modem properties from the drop-down list.
9	The Edit Phonebook Entry window displays. Click the Server tab.
10	In the Dial-up server type , select PPP . Under Network protocols , check the box next to TCP/IP . Remove the check marks from all other selection boxes. Click the TCP/IP button.
11	The PPP TCP/IP Settings window opens. Ensure that the following are checked: <ul style="list-style-type: none">• Server assigned IP address• Server assigned name server addresses• Use IP header compression• Use default gateway on remote network All other boxes should remain unchecked. Click OK .
12	Click OK to complete the set up.

Modem Configuration – Windows 2000

Install the Modem

1	Go to Start→ Settings→ Control Panel and click on the Phone and Modem icon.
2	The Phone and Modem Options window opens. Click the Modems tab.
3	The Modems window opens. Click Add .
4	The Install New Modem window opens. Check the Don't detect my modem; I will select if from a list box then click Next .

5	The Modem Detection window opens. Under Manufacturer , select (Standard Modem Types) . Under Models , click Standard 19200 bps Modem . Click Next .
6	The Port Selection window opens. Highlight the COM port that you will be using to connect to your modem (i.e., COM1, COM2, COM3, etc.). Click Next .
7	The Digital Signature Not Found window opens. Click Yes to proceed.
8	The Modem Installation Finish window opens. Click Finish .
9	The Modems window reappears with the newly added Standard 19200 bps modem displayed in the dialog box. Click OK .

Create and Configure a Dial-up Networking Connection

1	From the computer's desktop, double-click the My Computer icon. Then, double-click the Control Panel icon.
2	The Control Panel window opens. Double-click on the Network and Dial-up Connections icon.
3	The Network and Dial-up Connections window opens. Double-click on Make New Connection .
4	The Network Connection Wizard window opens. Click Next .
5	The Network Connection Type window opens. Select Dial-up to the Internet and click Next .
6	The Welcome to the Internet Connection Wizard opens. Select I want to set up my Internet connection manually, or I want to connect through a Local Area Network (LAN) and click Next .

7	The Setting up your Internet connection window opens. Select I connect through a phone line and a modem and click Next .
8	The Choose Modem window opens. From the drop-down box, select Standard 19200 bps Modem and click Next .
9	The Internet Connection, Step 1 window opens. Enter a temporary telephone number (this phone number will be modified in Modem Properties later in the configuration). Make sure that the Use area code and dialing rules is NOT checked . Click Advanced .
10	<p>The Advanced Connection Properties window opens with the Connection tab selected. Verify the following settings:</p> <p>Under Connection type:</p> <ul style="list-style-type: none">• PPP (Point-to-Point Protocol) – should remain checked• Disable LCP Extensions – should remain checked• SLIP – should remain unchecked• C-SLIP – should remain unchecked <p>Under Logon procedure:</p> <ul style="list-style-type: none">• None – should remain checked• Log on manually – should remain unchecked• Use logon script – should remain unchecked.
11	<p>Click the Addresses tab and verify the following settings:</p> <p>Under IP address:</p> <ul style="list-style-type: none">• Internet service provider automatically provides one –should remain checked

<ul style="list-style-type: none"> • Always use the following – should remain unchecked <p>Under DNS server address:</p> <ul style="list-style-type: none"> • My ISP automatically provides a DNS address – should remain checked • Always use the following – should remain unchecked. <p>Click OK.</p>
<p>12 The Internet Connection, Step 2 window opens. User name and password are not required fields. Click Next. You will receive two warning boxes asking if you want to continue with a blank user name and a blank password. Click Yes on both boxes.</p>
<p>13 The Internet Connection, Step 3 window opens. Enter a name for the connection, such as <i>iR1200 Modem</i>. Click Next.</p>
<p>14 The Set Up Your Internet Mail Account window opens. Select No (optional) and click Next.</p>
<p>15 The Completing the Internet Connection Wizard window opens. Click Finish.</p>

Modify Dial-up Connection Parameters

<p>1 From the computer's desktop, double-click the My Computer icon. Then, double-click the Control Panel icon.</p>
<p>2 The Control Panel window opens. Double-click on the Network and Dial-up Connections icon.</p>
<p>3 The Network and Dial-up Connections window opens with the new iR1200 Modem icon inside.</p>
<p>4 Right-click on the iR1200 Modem connection icon and select Properties.</p>

5 The **iR1200 Modem** window opens. Select the **General** tab. In the **Phone number** box, erase the temporary phone number previously entered:

- For Packet Data enter: **s=2**
- For Circuit Switched Cellular enter: **the ISP phone number**

Click **OK**.

Modem Profiles and Settings

In this chapter, you will learn how to use AT commands to setup parameters and configure the iR1200 modem for usage.


This chapter includes:

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Opening HyperTerminal Session	Page 56
Configuring with AT Commands	Page 57
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Activate DCD Management	Page 58
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Select SLIP or PPP	Page 59
Mobile IP Activation	Page 60
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Mobile Node IP Prefix Length	Page 61
Header Compression	Page 62
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HyperTerminal Setup

A HyperTerminal session must be setup for you to enter AT commands.

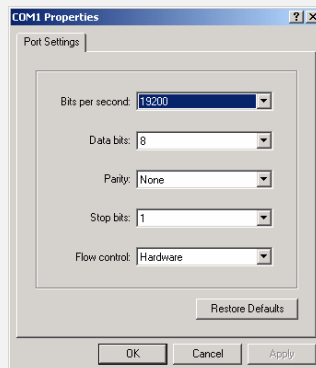
The following table outlines steps to setup a HyperTerminal session for the iR1200 modem:

1	From your computer, locate and select the HyperTerminal program.
2	The Connection Description screen appears. <div data-bbox="589 732 1015 1100"></div>
3	Type a description of the connection in the Name: box.
4	Select the dial function (red and yellow phone icon) and click OK .
5	The Connect To screen appears.



- 6** Select the appropriate communication port (typically COM1) from the “Connect Using:” drop-down list then Click OK.

- 7** The **COM1 Properties** screen appears.



- 8** Select the following parameters from each of the drop-down list on the Port Settings tab:

- **Bits Per second: 19200**
- **Data Bits: 8**

<ul style="list-style-type: none">• Parity: None• Stop Bits: 1• Flow Control: Hardware
9 Click OK when all the parameters have been selected.
10 Test to make sure that you have established communication with the modem by typing the AT command “ ATi4 ” and pressing Enter .
11 You should see a message “ Nextel, iDEN OK ” or “ Nextel, iDEN 0 ”.

Opening a HyperTerminal Session

The following table describes steps to start a HyperTerminal Session:

1 Windows 2000/XP/Windows 98: Start→Programs→Accessories→Communications→Hyper Terminal.
2 Windows NT: Start→Programs→Accessories→HyperTerminal→HyperT erminal
3 The HyperTerminal window will open. You are now ready to issue AT commands to the Modem.

Configuring With AT Commands

Modem Initialization

The iR1200 modem's factory default image 2 is configured to start up with packet data. If you are using circuit switched data, we recommend that you

Step 1 – Backup image 2 (default) to image 1

AT Command	Save User Default profile 2 to profile 1
Command Syntax	AT&W1
Expected Return Code(s)	OK

Step 2 – Change default call setting (packet data) to circuit switched

AT Command	Change Call Setting Parameter
Command Syntax	ATZ0
Expected Return Code(s)	OK

Step 3 – Save new setting as default profile.

AT Command	Save User Default Configuration
Command Syntax	AT&W2
Expected Return Code(s)	OK

Restore Factory Defaults

To ensure a clean configuration process, you should restore the current values to their factory default values by applying the following.

AT Command	Restore Factory-Default
------------	-------------------------

	Configuration
Command Syntax	AT&F
Expected Return Code(s)	OK

Activate DTR Monitoring

The DCE does not monitor the DTR line of the DTE/DCE physical connection. This is the default factory setting. To activate DTR monitoring in the DCE, you must apply the following command.

AT Command	DTR Behavior
Command Syntax	AT&D2
Expected Return Code(s)	OK

Activate DCD Management

The factory default for the modem keeps the Data Carrier Detect (DCD) line of the computer-to-modem physical connection active at all times. Some communication programs monitor this line to determine the status of the connection. To promote compatibility with these programs, enable DCD management in the modem.

AT Command	DCD Behavior
Command Syntax	AT&C1
Expected Return Code(s)	OK

Set Computer's IP Address

Inform the modem of the computer's IP address to establish SLIP or PPP connection between the modem and the computer.

AT Command	Computer IP Address
Command Syntax	AT+WPNEI=XXX.XXX.XX,

	0,0,0 (Insert appropriate IP address where X appears.)
Expected Return Code(s)	OK



IMPORTANT INFORMATION: Customers cannot ping a Non Routable IP address when provisioned due to the NAT (Network Address Translator) Server. This server attaches a Class C Public IP Address to a Private Class A Non Routable IP address for a specific period of time to browse the public internet. This Class C address is needed in order to route on the public internet, as Non-Routable IPs are for internal routing only (Intranet).

Select iDEN® Packet Wireless Data

The iR1200 modem supports multiple wireless data formats. Select the desired data service by applying the following command.

AT Command	Select WDS-side stack
Command Syntax	AT+WS46=24
Expected Return Code(s)	OK

Select SLIP or PPP

By default, the modem attempts to establish a PPP connection. To specify the type of connection the modem will establish, apply the following command

AT Command	Select computer-side stack
Command Syntax	AT+WS45=4 (PPP) AT+WS45=3 (SLIP)
Expected Return Code(s)	OK

Mobile IP Activation

The modem makes use of mobile IP to manage a truly mobile computer. You may use a Mobile IP stack on the computer or use the Mobile IP stack built into the modem.

By default, the modem is configured to work with a third-party stack. If you desire this mode of operation, skip ahead to the “Configure Encryption Settings”. Otherwise, you must activate the Mobile Node functionality within the modem as well the security-related parameters.

NOTE: The Data Terminal Equipment (DTE) uses a TCP/IP stack to format the data message with standard TCP/IP protocols used on the Internet. The iR1200 modem does not have a TCP/IP stack. The “mobile-IP stack” capability of the iR1200 is required to transmit data on the iDEN® network.

AT Command	Modem Mobile IP Control
Command Syntax	AT+WV300=1 (activate) AT+WV300=0 (deactivate)
Expected Return Code(s)	OK

Mobile IP Home Agent Address

You must supply the IP address for the Home Agent. This is accomplished by applying the following command

AT Command	MIP Home Agent Address
Command Syntax	AT+WV305=XXX.XXX.XX (Insert appropriate IP address where X appears.)
Expected Return Code(s)	OK

Mobile IP Authentication Key

The Mobile IP Authentication Key is used as a PIN number to validate your Mobile IP connection with the Home Agent.

AT Command	MIP Authentication Key
Command Syntax	AT+WV301="AAAXXX" (Make sure that the Authentication Key Name is entered with the quotation mark. Substitute the values within the quotation with the one supplied by your system administrator or service provider.)
Expected Return Code(s)	OK

Mobile IP Security Parameter Index (SPI)

The SPI is similar to the Authentication Key in that the modem and the home Agent must have identical values registered for the computer.

AT Command	MIP Security Parameter Index
Command Syntax	AT+WV309=XXX (Insert appropriate SPI where X appears, the SPI can be obtained from your system administration or service provider.)
Expected Return Code(s)	OK

Mobile Node IP Prefix Length

The IP address prefix length is the number of contiguous bits that make up the network prefix of that address. This command allows you to specify the prefix length of the computer's IP address.

AT Command	Mobile Node IP Prefix Length
Command Syntax	AT+WV311=X

	(Insert appropriate prefix length where X appears.)
Expected Return Code(s)	OK

Header Compression

This command enables or disables TCP header compression options. Some DTE-side stacks (such as PPP) will negotiate local header compression independently from this setting. To disable header compression, apply this command.

AT Command	Header Compression
Command Syntax	AT+ws182=<header compression> AT+ws182? (?=Query parameter) AT+ws182=? (?=Range Parameter)
Parameter Value	0 = over the air and local header compression enabled. 1 = over the air header compression enabled. 2 = Local header compression enabled 3 = header compression disabled.
Expected Return Code(s)	OK

Saving AT Settings

Your modem is now properly configured for Nextel's iDEN® network.

IMPORTANT: These settings are stored on the modem's Random Access Memory (RAM) and are lost when the modem is turned off unless stored in the modem's non-volatile memory.

The iR1200 modem can store up to three profile or image. By default, image 2 is loaded when the modem is powered on. We recommend that you save this setting to the first profile/image.

AT Command	Save User Default Configuration
Command Syntax	AT&W1
Expected Return Code(s)	OK

GPS Default Parameters

The iR1200 GPS-Enabled modem will use the following NMEA default parameters.

The factory default port characteristics are:

- Baud rate = 4800 bps
- Data bits = 8
- Stop bits = 1
- Parity = None

Note: These settings should not be changed unless absolutely necessary.

AT Commands

This chapter describes common AT commands that can be applied to the iR1200 modem.

This chapter includes:

General AT Commands	Page 65
User Image Profile Commands	Page 66
Registration, Reset, and Authentication Commands	Page 66
Network Status Commands	Page 66
Other Useful Commands	Page 67

General AT Commands

Command	Usage	Action
AT	AT	Checks communication.
ATEx	ATE0 or ATE1	Sets echo on or off.
AT&V	AT&V	Displays modem parameters.
AT+IPR	AT+IPR = baud rate	Sets the modem's baud rate.

User Image Profile Commands

Command	Usage	Action
ATz	ATz0, ATz1, or ATz2	Sets the specified image as the active image.
AT&Wx	AT&W0, 1, or 2.	Writes active image to the specified profile

Registration, Reset, and Authentication Commands

Command	Usage	Action
AT+wwreset	AT+wwreset	Resets the modem and performs power cycle.
AT+wwmr	AT+wwmr='xxxx' (0000)	Modem Resets the modem.
AT+wwcsk	AT+wwcsk='xxxx' (0000)	Changes authentication service key.
AT+wwrsk	AT+wwrsk='xxxx' (0000)	Resets the service key to all 0's.
AT+WPDEREG	AT+WPDEREG	Forces modem to deregister.
AT+WPREG	AT+WPREG	Forces mode to register

Network Status Commands

Command	Usage	Action
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AT Commands

AT+WS53?	AT+WS53?	Checks Signal Quality
AT+WS50?	AT+WS50?	Check Signal Strength
AT+WPSTATE	AT+WPSTATE	Checks mobile IP registration
AT+WPREG	AT+WPREG	DTE IP Address

Other Useful AT Commands

The following table outlines other common AT commands for your reference.

Answer

This command instructs the DCE to immediately connect to the call and start the answer sequence, as appropriate for the selected service.

Command		A
Action	ATa	
Query		
Range		

Command Mode Echo

The setting for this parameter determines whether or not the DCE echoes characters received from the DTE during command state and online command state.

Command		E
Action	ATe <echo>	
Query	AT&v	
Range		
Parameter	0 = Disabled command mode character echo.	

Values:	1 = Enabled command mode character echo.
---------	--

Dial

This command instructs the DCE to originate a call. When the DCE receives the dial string from the computer, all non-numeric characters in the Dial String that are not recognized dial-modifiers are ignored. This allows the DTE to request modem numbers containing unsupported dial modifiers, hyphens, parenthesis, and other punctuation.

Command	D
Action	ATd <Dial String>
Query	
Range	
Parameter Values (dial modifiers) :	Dial string contains a modem number to be dialed, translated into an array of ASCII characters between 0 and 9 inclusive T = Allowed, but ignored by the modem. P = Allowed, but ignored by the modem. ! = Hook Flash (1/2 second). W = Wait for time specified in S7 for dial tone. (blank) = Wait for time specified in S7 for one or more rings followed by five seconds of silence before continuing execution of dial string. , = Pause for time specified in S8 ; = After dialing return to command mode.

Hang-up

This command instructs the modem to terminate the active call.

Command H	
Action	ATh
Query	
Range	

Request Modem Information

This command causes the modem to issue a string to provide product information.

Command I	
Action	ATi <request>
Query	
Range	
Parameter Values:	0 = OK Response code 1 = iDEN DTE/DCE Specification Version 2 = Software Model 3 = Product Model 4 = Product Manufacturer

Go Online

This command causes the modem to enter the online state from the online command state.

Command O	
Action	Ato

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Query	
Range	

Pulse Dialing

This command selects pulse dialing. It is provided for compatibility purposes.

Command P	
Action	Atp
Query	
Range	

Quiet Mode

This command controls whether or not the result codes are sent to the computer. If turned on, the Result Code Format and Extended Result code commands may further modify the result codes.

Command Q	
Action	ATq <setting>
Query	
Range	
Parameter Values:	0 = Result codes sent 1 = Result codes not sent

Tone Dialing

This command selects DTMF dialing. It is provided for compatibility purposes and has no processing effect.

Command T	
------------------	--

Action	ATt
Query	
Range	

Verbose Result Codes

This command sets your preference for the result code format. It allows the computer to select either Terse or Verbose result code formats.

Command V	
Action	ATv <setting>
Query	AT&v
Range	
Parameter Values:	0 = Numeric result code format 1 = Verbose result code format

Extended Result Codes

This command provides an extended result code selection.

Command X	
Action	ATx <setting>
Query	AT&v
Range	
Parameter Values:	0, 1 = The modem does not return the BUSY or NO DIALTONE result codes. 2 = The modem might return the NO DIALTONE result code if appropriate, but does not return the BUSY result code. 3 = The modem may not return the BUSY result code, if

	appropriate, but does not return the NO DIALTONE result code. 4 = The modem may return either the BUSY or NO DIALTONE result code, if appropriate.
--	---

Restore User Defaults

This command causes the modem to reset all parameters and S-registers to their user-defined default values. There are three sets of user defaults (or images). The parameter selects between which image is being requested.

Command Z	
Action	Atz <image>
Query	
Range	
Parameter Values:	0 = Local user image 0 1 = Local user image 1 2 = Local user image 2

DCD Behavior

This parameter determines how the DCD line relates to the detection of received line signals from the distant end.



Changing the parameter takes effect immediately in both the command and online command states.

Command &C	
Action	AT&c <setting>
Query	AT&v

Range	
Parameter Values:	<p>0 = DCD always on</p> <p>1 = The modem turns on the DCD to indicate the presence of a connection, and turns off the DCD to indicate the loss of connection.</p>

DTR Behavior

This parameter determines how the computer responds when the DTR line is changed from the ON condition to the OFF condition during the online data state.

Command	&D
Action	AT&d <setting>
Query	AT&v
Range	
Parameter Values:	<p>0 = Modem ignores DTR</p> <p>1 = If the DTR is turned ON while in online data mode, the mode returns the command mode and issues the OK result code. The call remains connected.</p> <p>2 = If the DTR is turned OFF while in online data mode, the modem disconnects the call and returns the OK result code. If DTR is OFF while in command mode, the modem will not answer an incoming call, regardless of the setting, S0 (automatic answer).</p>

Restore Factory Default

This command causes the modem to reset all parameters and S-registers to their factory defined default value. The optional parameter value, if present must be 0.

Command	&F
---------	----

Query	
Range	

Local Character Framing

This parameter determines the local serial port asynchronous data framing. The second parameter is needed only if you select fewer than eight data bits.

Command	&ICF
Action	AT+icf <framing>, <parity>
Query	AT+icf?
Range	AT+icf?
Framing Parameter Values:	0 = AutoDetect 3 = 8 data bits, 1 stop bit 5 = 7 data bits, 1 parity bit, 1 stop bit
Parity Parameter Values:	0 = Odd 1 = Even 2 = Mark 3 = Space

Local Flow Control (PCCA)

This extended compound parameter controls, the local flow control between the computer and the modem. The two numeric sub-parameters are DCE_by_DTE (which controls the data format he modem) and DTE_by_DCE (which controls the data from the computer).

NOTE: To change the setting of these parameters, use the &K command.

Command	+IFC
Action	AT+ifc <DCE_by_DTE>, <DTE_by_DCE>
Query	AT+ifc?
Range	AT+ifc=?

DCE_by_ DTE Parameter Values:	<p>0 = No flow control was set by DTE.</p> <p>1 = XON/XOFF; do not pass XON/XOFF characters to the remote DCE.</p> <p>2 = RFR active/inactive flow control</p> <p>3 = XON/XOFF; Pass DC1/DC3 characters to the remote DCE in addition to acting upon local flow control.</p>
DTE_by_ DCE Parameter Values:	<p>0 = No flow control was set by DTE.</p> <p>1 = XON/XOFF flow control</p> <p>2 = CTS/RFS active/inactive flow control</p>

Command	+IPR
Action	AT+ipr=<rate>
Query	AT+ipr?
Range	AT+ipr=??
Parameter Values:	<p>0 = Automatic detection on baud rate, data framing</p> <p>300 = Transmission speed in bits per second.</p> <p>2400 = Transmission speed in bits per second.</p> <p>4800 = Transmission speed in bits per second.</p> <p>9600 = Transmission speed in bits per second.</p> <p>19200 = Transmission speed in bits per second.</p>

	38400 = Transmission speed in bits per second. 57600 = Transmission speed in bits per second. 115200 = Transmission speed in bits per second.
--	---

Lock/Unlock the DCE

When the DCE is locked, communication over the serial port to the modem is suspended.

NOTE: If the PIN was removed (by setting its value to the empty string (" "), the DTE must still specify the PIN, represented by the empty string.

Command	+WCLK
Action	AT+wcl= <LockStatus>, <PIN>
Query	
Range	AT+WCLK=?
Parameter Values – Lock Status:	0 = Unlock the DCE 1 = Lock the DCE
	PIN A PIN is stored as a series of alphanumeric characters, with a maximum length of 8 characters. If more than 8 characters are set as a PIN, only the first 8 are recognized.

Change the DCE's PIN.

This command sets the PIN that locks or unlocks the DCE.

NOTE: You must specify the desired PIN, as well as the current PIN. The factory-default PIN is the "empty string" or a value of " ".

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Command +WCPN	
Action	AT+wcpn=<newPIN>, <oldPIN>
Query	
Range	AT+wcpn=?
Parameter Values:	A PIN is stored as a series of alphanumeric characters, with a maximum length of 8 characters. If more than 8 characters are set as a PIN, only the first 8 are recognized.

Packet Data Sleep Timer

This timer controls the length of time the DCE stays on a packet channel though no traffic is actively being transferred.

Command +WS175	
Action	AT+ws175<timer>
Query	AT+ws175?
Range	AT+ws175=?
Parameter Values:	0 = Disable sleep timer 5-255 = Seconds before sleeping 10 = Default value

SLIP MTU

This setting specifies the Maximum Transmitted Unit used by SLIP connections. (PPP Connections negotiates this value).

Command +WV312	
Action	AT+wv312=<MTU>

AT Commands

Query	AT+vv312?
Range	AT+vv312=?
Parameter Values:	68-1500 = MTU Value Range 1006 = Default Value

Select Mobile IP Client

This parameter activates/deactivates the Mobile Node client in the DCE. The mobile host can operate in two modes to access the iDEN[®] packet data network.

Command +WV300	
Action	AT+vv300<MIP Mode>
Query	AT+vv300?
Range	AT+vv300=?
Parameter Values:	0 = Activate Mobile Node in DCE. 1 = Deactivate Mobile Node in DCE.

Mobile IP Authentication Key

The iDEN[®] network uses the MIP Authentication Key to verify the authenticity of the DCE with the Home Agent. The DCE and the Home Agent must have identical values for this shared secret key for the DCE to satisfy the authentication process.

NOTE: This command is applicable only when the Mobile IP Client in the DCE is activated.

Command +WV301	
Action	AT+vv301<"key">
Query	
Range	AT+vv301=?

Parameter Values:	<p>The authentication Key parameter is a text string of up to 32 characters. Unlike most text-string parameters, the Authentication key is a text representation of a hexadecimal number. Therefore, only the characters 0-9 and A-F are acceptable. (The lower case character, a-f is also acceptable).</p> <p>NOTE: Although the parameter represents a numeric value, the parameter is actually a text string, so the parameter must be enclosed in quotation marks.</p>
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Mobile IP Session Timer

The command determines the maximum amount of time that a remote node can be registered with its Home Agent before having to renew its registration. This parameter sets a user preference for a value that is negotiated within the network. During the negotiation process, the user preference may be overruled by the network without notification.

Command +WV302	
Action	AT+vv302<timer>
Query	AT+vv302?
Range	AT+vv302=?
Parameter Values:	<p>1800-65534 = Second before expiration</p> <p>65536 = Timer never expires</p> <p>7200 = Default value</p>

DTE IP Address

This command sets the mobile node's permanent IP Address (also known as the network Entry Identified, or NEI).

NOTE: This parameter is applicable only when the Mobile Node Client in the DCE is activated.

Command +WPNEI	
Action	AT+wpnei<"address">
Query	AT+wpnei?
Range	AT+wpnei=?
Parameter Values:	An IP Address consists of up to 15 characters, and is in the format "ddd.ddd.ddd.ddd". 0.0.0.0. = Default value

DTE IP Address Prefix Length

The prefix-length is the number of contiguous bits in an IP address that makes up the network prefix (or network number plus subnet number) of the IP address.

NOTE: This command sets the prefix length of the Mobile Node's IP address, as specified by +WPNEI.

Command +WV311	
Action	AT+wv311<length>
Query	AT+wv311?
Range	AT+wv311=?
Parameter Values:	2-24 = Prefix length 2 = Default value

Data Encryption

The DTE uses this command to select whether or not to encrypt the air-link interface and determines how the air-link is encrypted. Encryption is negotiated during the packet data registration.

Command +WV308	
Action	AT+vv308<encryption>, <firm offer>, <key size>
Query	AT+vv308?
Range	AT+vv308=?
Parameter Values - Encryption:	0 = Disabled 1 = Vancouver Encryption
Parameter Values – Firm Offer:	0 = Encryption setting is a negotiable preference. 1 = Encryption setting is not negotiable.
Parameter Value – Key Size:	40-64 = Encryption key size 40 = Default value

DTE Stack

This command sets the protocol for communication between the DEC and the DTE. Circuit-switched data connections allow only the transparent character stream for packet data connections; use SLIP or CSLIP or PPP.

Command +WS45	
Action	AT+ws45<stack>
Query	AT+ws45?
Range	AT+ws45=?
Parameter Values:	0 = Transparent Character Stream 1 = Reliable Transparent Character Stream (TMOL) 3= SLIP/CSLIP 4 = PPP

WDS Stack

This command changes the data mode of the modem between circuit-switched data and packet data.

Command +WS46	
Action	AT+ws46<service>
Query	AT+ws46?
Range	AT+ws46=?
Parameter Values:	23 = iDEN Circuit-switched data/fax 24 = iDEN packet data 252 = Local Data Services

Service Class

This command switches between normal circuit-switched data mode and Class 2 fax mode. This setting has no effect during the packet data service.

Command +FCLASS	
Action	AT+fclass<class>
Query	AT+fclass?
Range	AT+fclass=?
Parameter Values:	0 = Class 0 operation (modem operation) 2 = Class 2 operation (fax operation) 8 = Class 8 (voice operation – while tethered)

Packet Data Registration Timeout

This command allows the DTE to specify a maximum amount of time to wait for packet data operation.

Command	+WS198
---------	--------

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Action	AT+ws198<time>
Query	AT+ws198?
Range	AT+ws198=?
Parameter Values:	1-255 = Seconds 30 = Default value

Circuit Data Auto-Answer

This command determines if and when the DCE should automatically answer an incoming call.

Command S0	
Action	AT+s0<rings>
Query	AT+s0?
Range	AT+s0=?
Parameter Values:	0 = Do not automatically answer incoming calls 1-255 = Answer after specified number of rings

Circuit Data Establishment Timeout

This command allows the DTE to specify the maximum amount of time between a request for a circuit data connection and the establishment of this connection.

Command S7	
Action	AT+s7<timer>
Query	AT+s7?
Range	AT+s7=?

Parameter Values:	1-255 = Seconds 30 = Default value
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Comma Dial Modifier Timer

This command allows the DTE to set the duration of the pause associated with a comma (,) dial modifier.

Command S8	
Action	AT+s8<timer>
Query	AT+s8?
Range	AT+s8=?
Parameter Values:	0-255 = Seconds 2 = Default value

Circuit Data Idle Timer

This command specifies an idle line timeout for online data mode. If no data is sent by the DTE on the transmit data line for the specified period of time, the DCE disconnects the call, returns the OK result code, and returns to command mode.

Command S30	
Action	AT+s30<timer>
Query	AT+s30?
Range	AT+s30=?
Parameter Values:	0-255 = Seconds 0 = Default value

S-Registers

In this chapter, you will learn about S-registers and how to configure registers for your iR1200 modem.

This chapter includes:

S-Register	Page 87
Programming S-Register	Page 87
Reading S-Register	Page 88
Supported S-Register	Page 88

S-Registers

S-registers are memory locations in the modem that you can program to meet your communication needs. S-register parameters are numbered from 0 (zero) to 255. Since many of the registers are reserved for internal operation purposes, you are allowed to customize only a subset of the modem's register.

Programming the S-Register

The following table describes the steps to program an S-Register.

1	From the command mode of your communication software, type ATSn=x where n is the number of the S-register you wish to customize and x is the value that you wish to assign to that register.
2	Press ENTER to execute the command.



You may experience undesirable consequences if you modify the S7 or S10 registers from their set default values. For optimal performance, it is recommended that you use the default values set for these two registers.



If you write to an S-register that is not programmable or if the value you assigned is invalid, the modem will still return an OK message to the computer screen. The attempted changes will not affect the S-register values.

Reading an S-Register Value

The following table describes how to read a value for an S-Register.

- | | |
|---|---|
| 1 | From the command mode, type ATS_n (n= the number of the S-register that you want to read) and press ENTER. |
| 2 | The value of the requested S-register displays. |

NOTE: If you attempt to read the value of an S-register that is not supported, the modem will display an ERROR message.

Supported S-Registers

The following table outlines the list of S-Registers that can be used to customize your modem.

Register #	Function
0	Automatic Answer. Determines if the modem automatically answers incoming calls. <ul style="list-style-type: none">• If the value assigned to this register is 0 (zero), the modem does not answer the call but sends an appropriate message to the computer that commands the modem to answer the call.• If the value assigned to this register is a non-zero, the modem answers the call without waiting for the computer to issue its answer-call command.

S-Registers

Register #	Function
	Valid value ranges from 0 (zero) to 255. 0 (zero) is the default value.
2	Escape (ESC) Code Character. Specifies the ASCII character to be used to escape from either data or online mode to command mode. Valid value ranges from 0 (zero) to 127. 43 or the ASCII plus (+) key is the default value.
3	Command Line Terminating Character. Specifies the ASCII character to be used to terminate a command line without carrying out any command that might be issued. Valid value ranges from 0 (zero) to 127. 13 (which represents the ENTER (PC Compatible) or RETURN (Macintosh) key) is the default value.
4	Response Format Character. Valid value ranges from 0 (zero) to 127. 10 is the default value.
5	Command Line Editing Character. Valid value ranges from 0 (zero) to 127. 8 (representing the Backspace key) is the default value.
6	Pause Before Blind Dialing. Valid value ranges from 2 to 10. 2 (seconds) is the default value.
7	Connection Completion Timeout. Valid value ranges from 0 (zero) to 255 seconds. 120 (seconds) is the default value.

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Register #	Function
8	Command Dial Modifier Time. Valid value ranges from 0 (zero) to 255 seconds. 2 (seconds) is the default value.
10	Automatic Disconnect Delay. Determines the amount of time between loss of carrier and disconnection of the data call. Valid value ranges from 1 to 254 tenths of a second. 14 (1.4 seconds) is the default value.
12	Escape Code Timer. Determines the time duration within which the escape code must be sent by the computer to escape from online command mode. The time (in seconds) the modem waits is determined by dividing the specific register value by 50. Valid value ranges from 20 to 255. 50 or 1 second (50/50) is the default value.
30	Idle Timeout. Determines the amount of time that the modem waits in online mode for a command from the computer before disconnecting the call and returning to command mode. Valid value ranges from 0 (zero) to 255 seconds. 0 (infinite time period) is the default value.

Troubleshooting

This chapter describes typical configuration problems and provides instructions on how to troubleshoot issues with the iR1200 modem.

This chapter includes:

Common Problems	Page 91
Error Messages	Page 93
Diagnostic Commands	Page 94
Extended AT Command	Page 95
Extended Error Result Codes	Page 95

Common Problems

The following table identifies the most common problems that may occur while setting up and using your modem for data calls.



IMPORTANT INFORMATION: Customers cannot ping a Non Routable IP address when provisioned due to the NAT (Network Address Translator) Server. This server attaches a Class C Public IP Address to a Private Class A Non Routable IP address for a specific period of time to browse the public internet. This Class C address is needed in order to route on the public internet, as Non-Routable IPs are for internal routing only (Intranet).

Symptom	Troubleshooting Tips
The modem does not respond to AT commands.	Make sure that: <ul style="list-style-type: none"> • The modem is powered on. • The cable is properly connected to the

Symptom	Troubleshooting Tips
	<p>modem.</p> <ul style="list-style-type: none"> • The cable is connected to the correct port. • The correct port is specified in your communication software. • The modem is set to the same baud rate specified in the communication software.
The NO CARRIER message displays when the modem attempts data calls.	Make sure that the S7 register contains a value greater than or equal to 60 by issuing an AT&V command or by explicitly setting ATS7='x' (where x is, enter any number between 1 and 255).
Modem does not auto-answer incoming data calls (not default operation).	Make sure that the S0 register contains a value other than 0 (zero) by issuing the AT&V command. You can also explicitly set ATS0=x from the software's command mode (where x is any number between 1 and 255).
Received data is unrecognizable.	Make sure that the flow control is set to RTS/CTS (hardware flow control is enabled) in the communication software and is set to &K3.
Data is being intermittently lost.	Make sure that the flow control is set to RTS/CTS (hardware flow control is enabled) in the communication software and is set to &K3.
Modem seems to respond slower than usual.	Check the signal strength icon to be sure the signal is not weak.

Symptom	Troubleshooting Tips
Modem keeps dropping connection.	Check the signal strength and signal quality icon to be sure the signal is not weak or poor.
Modem does not respond to hang-up command from the software's command mode.	Make sure that: <ul style="list-style-type: none"> • The Drop DTR on Hang-up is enabled in the communication software. • The hang-up string setting is '+++ATH'.
Computer screen appears distorted.	Turn off Auto Baud by initiating AT+IPR command. Make sure that the baud rate setting in your communication software matches the baud rate setting of the modem.
No characters are displayed on the computer screen	Turn on Local Echo by initiating the ATE1 command.
Images transmitted/received are of poor quality.	Ensure that the RTS/CTS flow control is enabled in the communication software and is set to &K3.

Error Messages

The following table outlines error messages that you may receive when sending or receiving data. These error messages will appear on the computer screen

Message	Explanation
ERROR	<ul style="list-style-type: none"> • The command was not recognized. • The command line maximum length was exceeded.

Message	Explanation
	<ul style="list-style-type: none">An invalid parameter was entered. The command line is ready for another command. Make sure that the command (and parameter) that you entered are valid.
BUSY	The number you called is busy. You should try the call again later. The modem is ready to accept another command.
MODEM INITIALIZATION FAILED	Your communication software assumes that Auto Baud is supported by the modem. Make sure that: <ul style="list-style-type: none">That the baud rate = 19200 bps.If Auto Baud is turned on in the software, it must be turned on in the programming menu of your modem.
NO CARRIER	Your connection was terminated, or an attempt to establish the connection failed. Try your call again and contact your iDEN carrier.

Diagnostic Commands

If a data connection could not be established, you might be able to determine the cause through the AT command interface.

The following steps describe how to obtain modem or system information that will help you with configuration or communication problems.

- 1 Close all data applications. These applications may start a retry command that will interfere with your troubleshooting efforts.
- 2 Unplug and reconnect the data cable. This will terminate

	any ongoing data connections.
3	Establish basic computer to modem communication.
4	Administer the following AT command to query for the last "Extended Error Code".

Extended Error AT Command

AT Command	Return Product Information
Command Syntax	AT+CEER
Expected Return Code(s)	See Extended Error Result Codes Table

Extended Error Result Codes

Extended error result codes report the network reason why a data connection failed. If you report a failed connection to Nextel's Customer Care, be sure to provide the error result code.

Code	General Description
<i>General Modem Operation</i>	
257	No further information is available
259	A command was issued during an improper state.
260	User aborted the connection.
261	DCE does not recognize an AT command.
262	Connection was aborted due to connection timeout.
263	Parameters for an AT Command are out of range.
266	The +FCLASS command failed due to incompatibilities with the current setting of the +WS46 command.
267	The +WS45 command failed due to incompatibilities with the value of the +WS46 command.

Code	General Description
268	Invalid DTE-IP address was specified (+WPNEI).
269	Invalid Home Agent address was specified (+WV305)
270	Invalid MIP Security Parameter index was specified.
271	DCE IP address matched Home Agent IP Address (+WV304, +WV305).
272	The DTE tried to lock or unlock the DCE using an incorrect PIN.
275	An AT Command is not compatible with the current/active data service.
<i>Packet Data Operation</i>	
519	Requested level of encryption is not allowed.
545	Service is not present.
612	A data registration error was found. Contact your service Provider.
833	FA: Mobile Node Administrative is prohibited form registration.
835	FA: Mobile Node Authentication failed.
836	FA: Home Agent Authentication failed.
897	HA: Mobile Node Administratively is prohibited from registration.
899	HA: Mobile Node Authentication failed.
900	HA: Foreign Agent Authentication failed.
1025	SLIP/PPP failed to respond.
1026	SLIP/PP failed to configure the connection.

Code	General Description
1027	SLIP/PPP link terminated.
<i>Circuit Data Operation</i>	
1280	No information is available.
1290	Unspecified Transmit Phase A Error.
1300	Unspecified Transmit Phase B Error.
1320	Unspecified Transmit Phase C Error.
1330	Unspecified Transmit Phase D Error.
1350	Unspecified Receive Phase B Error.
1360	Unspecified Receive Phase C Error.
1370	Unspecified Receive Phase D Error.
<i>Network Error Codes</i>	
1558	No route to specified transit network.
1539	No route to destination.
1553	Called unit is busy.
1563	Destination is out of order.
1564	Invalid number format – incomplete.
1570	No circuit/channel is available.
1574	Network is out of order.
1577	Temporary failure.
1578	Switching equipment congestion.
1580	Requested circuit/channel is not available.
1583	Resource is unavailable.

Code	General Description
1594	Bearer capability is not presently available.
1593	Bearer capability is not authorized.
1599	Service or option is not available.
1601	Bearer service is not implemented.
1602	Channel type is not implemented.
1615	Service or option is not implemented
1624	Incompatible destination.

Safety Notice

The following information is important for the safe and efficient operation of the iR1200 modem. Please read this safety notice before operating the modem.

Safe and Efficient Operation Guidelines

Your modem contains a transmitter and receiver. When it is ON, it receives and transmits radio frequency (RF) energy. The modem operates in the frequency range of 806 MHz to 870 MHz and utilizes the digital modulation techniques. This product is authorized by FCC Rule Part 47CFR2.989 (b) which states that it should be used in such a way that it maintains a distance of at least 8 inches (20 cms) between the human body and the radio's antenna or modem. When you use your modem, the system handling your call controls the power level at which your modem transmits. The output power level typically varies from 0 mW to 700 mW.

Exposure to Radio Frequency Energy

Your modem is designed to comply with the United States Federal Communications Commission, Code of Federal Regulations; FCC part 90-sub part S, and FCC-part 15, Class B. The modem complies with FCC's national standards and guidelines regarding exposure of human beings to radio frequency electromagnetic energy.

Medical and Personal Electronic Devices

Most electronic equipment is protected from RF energy. However, certain equipment may not be shielded against RF signals being emitted from your modem.

Pacemakers

Operators should not use the modem if individuals with pacemakers are within 6 inches (0.15 meters) of the antenna.

Hearing Aids

The modem may interfere with hearing aid devices. Individuals who experience such interference should consult the hearing aid manufacturer to discuss alternative solutions.

Other Medical Devices

Individuals who have other medical devices not specifically mentioned in this safety notice may want to consult their physician or the manufacturer of the device to determine if it is adequately protected from external RF energy.

Interference with Other Electronic Devices

RF energy may affect improperly installed or inadequately protected electronic operating and entertainment systems in motor vehicles. Check with the manufacturer or representative to determine if these systems are adequately shielded from external RF energy. It is recommended that you also check with the manufacturer of any equipment that has been added to the vehicle.

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Appendix A: Glossary

This glossary contains terms and definitions used within this guide. It is by no means exhaustive of terms that you may come across.

ASCII

American Standard Code for Information Interchange. A standard set of 128 characters, symbols and control codes used for computer communications. ASCII characters require 7 bits of data to send, but are often sent 8 bits at a time with the extra bit being a zero.

Asynchronous Communication

A method of sending data in which the bits can be sent at random times. Data transmission is not synchronized to a clock. With asynchronous transmission, each character is transmitted one at a time with a “start” bit at the beginning and one or more “stop” bits at the end. Any amount of time can elapse before the next character can be sent.

AT Command

An order entered into the computer to request your modem to perform certain actions, such as dial a teledmodem number. AT commands are Hayes-compatible modem commands.

Baud

The signaling rate of a line, which is the number of transitions (voltage or frequency changes) that are made per second.

Baud Rate

Signaling speed of the modem. Common baud rates are 2400, 4800, 9600, 19200, and 56k.

Byte

A data unit of eight bits.

Circuit Switched Data

A networking technology that provides a temporary, but dedicated, connection between two stations no matter how many switching devices the data is routed

through. Circuit Switch was originally developed for the analog-based telephone system in order to guarantee steady, consistent service for two people engaged in a phone conversation.

Command Mode

The mode that accepts AT commands. Also known as Terminal Mode. When your modem is in this mode, it is waiting to receive AT commands that you type from your communication software.

Communication Software

A computer program designed to connect your computer to an external source, such as another computer or a fax machine.

Configuration

The term configuration defines the hardware components that comprise a subsystem and system. It is a set of conditions or parameters that define the structure of an item such as the GPS processing and characteristics of the RS-232 interface ports.

Data Services

One of the functions of your iDEN[®] modem. Data services uses both circuit-switched and packet data transmissions.

DCD

Data Carrier Detect. An acceptable carrier signal received by the modem over the modem line. Also known as Received Line Signal Indicator (RLSI).

DCE

Data Communication Equipment. The equipment that establishes, maintains, and terminates a connection. It converts data into units of sound and vice versa for communication over telemodem or cellular networks.

Default

A factory preset choice that, under normal circumstances, works best for your system. You can either accept the default or change it.

Differential Capable

A term used to describe a GPS receiver capable of receiving and applying differential GPS corrections.

Differential GPS

A procedure of correcting GPS solutions to achieve improved position accuracy. Differential GPS provides 2 to 5 meter position accuracy. Differential accuracy is obtained by applying corrections determined by the stationary Differential Reference Station to the GPS data collected by the RPU (receiver processing unit) on-board the vehicle.

DNS

Domain Name Server. This is what converts names of domains (ex. : www.nextel.com) into IP addresses (ex. : 170.206.225.22). The DNS server that you use is generally situated with your access provider.

DTE

Data Terminal Equipment. A computer or hand-held device that generates and receives data, and provides functions that control data communications through a device like the modem.

Dial Up Networking (DUN)

A component in Windows that enables you to connect your computer to a network via modem. If your computer is not connected to a LAN and you want to connect to the Internet, you need to configure Dial-Up-Networking (DUN) to dial a Point of Presence (POP) and log into your Internet Service Provider (ISP). Your ISP will need to provide certain information, such as the gateway address and your computer's IP address.

Firmware

A set of software computer/processor instructions permanently or semi-permanently resident in read-only memory.

Frequency

The number of vibrations per second of an audio or radio signal. Measured in hertz (Hz), Kilohertz (kHz), or megahertz (MHz). GPS frequencies are L1= 1575.42 MHz or L2= 1227.60 MHz.

GPS

(Global Positioning System) is a "constellation" of 24 well-spaced satellites that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographic location. The location accuracy is anywhere from 100 to 10 meters for most equipment. Accuracy can be pinpointed to within one (1) meter with special military-approved equipment. The GPS is owned and

operated by the U.S. Department of Defense but is available for general use around the world.

GPS Antenna

An antenna designed to receive GPS radio navigation signals.

GPS Processor

An electronic device that interprets the GPS radio navigation signals (received by the GPS antenna) and determines a location solution. The GPS processor may also be able to apply (and determine) differential GPS corrections.

GPS Receiver

The combination of GPS antenna and GPS processor.

Hand-Held Devices

Small computing appliances, such as palmtops, personal digital assistants and pen-based computers.

Hertz (Hz)

A frequency unit equal to one cycle per second.

Home Agent

The carrier or router responsible for determining the next network point to which a packet (data) should be forwarded toward its destination.

Internet

A series of interconnected local, regional, national and international networks, linked using TCP/IP. The Internet links many government, university, research and commercial sites. It provides e-mail, Web browsing and file transfer services.

Internet Service Provider (ISP)

Provides your computer with Internet access. Also known as Service Provider.

Intranet

A network based on TCP/IP protocols (an internet) belonging to an organization, usually a corporation, accessible only by the organization's members, employees or others with authorization. An Intranet's Web sites look and act just like any other Web sites, but the firewall surrounding an intranet fends off unauthorized access.

Kbps

Kilobits per second. Generally represented at 1000 bits per second.

Laptops

Portable computers, such as notebooks and sub-notebooks.

Local Area Network (LAN)

A computer network that spans over a relatively small area. Most LANs are confined to a single building or group of buildings.

Mobile IP

An IP enhancement that provides forwarding of traffic to moving users. It uses agents in the user's home network and in all foreign networks. When logging on to a remote network, users register their presence with the foreign agent, and the home agent forwards the packets to the remote network. Mobile IP permits mobile devices to inform a "visited" network that it is present and then arrange to have its home network forward data to it automatically.

Modem

An electronic device enabling digital data to be sent over analog transmission facilities. Converts a digital signal to analog and back to digital again. Modem stands for Modulator/De-Modulator.

NMEA

National Marine Electronics Association. An association that defines marine electronic interface standards for the purpose of serving the public interest.

Non-Routable IP

A communications protocol that contains only a device address and not a network address. It does not incorporate an addressing scheme for sending data from one network to another. Examples of non-routable protocols are NetBIOS and DEC's LAT protocols. Also some TCP/IP addresses are considered non-routable.

Non-Volatile Memory

Memory that holds its content without power. Permanently stored information that is not lost when you power off. ROMs, PROMs, EPROMs and flash memory are examples.

Packet of Data

A bundle or block of data, organized in a specific way for transmission.

Parallel Port

A low speed port, usually located on the rear of a computer which usually connects to printers. Parallel ports transmit data simultaneously over eight “parallel wires” one byte at a time (as opposed to a serial port, which transmits data one bit at a time).

Parity Bit

Parity is a process for detecting whether bits of data have been altered during transmission. A Parity Bit is a non-data bit that is added to a group of data bits to check for transmission errors. Parity Bits are used in Parity checking which is an error-checking method in asynchronous transmission. The parity bit tells the receiving end of a transmission whether there should be an even or odd number of bits contained in that transmission.

PIN

Personal Identification Number.

PING

(Packet INternet Groper) An Internet utility used to determine whether a particular IP address is online. It is used to test and debug a network by sending out a packet and waiting for a response. A program used to test whether or not a network component is available.

PPP

(Point-to-Point Protocol) The most common method for connecting to the Internet. PPP provides serial line (dial-up) connectivity, authentication, compression and encryption between two computers and can handle several protocols simultaneously.

Protocol

Hardware and software standards that govern transmission between two communications devices. There are several layers, or levels, of functionality in a protocol. Each layer may be available, as a separate software component, or several layers may be combined into one.

Public IP Address

See Routable IP Address.

RAM

Random Access Memory is the working memory of the computer where you can enter information and call up data.

Routable IP Address (Public IP Address)

A communications protocol that contains a network address as well as a device address, allowing data to be routed from one network to another. Examples of routable protocols are SNA, OSI, TCP/IP, XNS, IPX, AppleTalk and DECnet.

RS-232

A communication standard for digital data. Specifies a number of signal and control lines. RS-232 is often associated with a 25-pin connector called DB-25.

Serial Port

An input/output (I/O) port transmits data one bit at a time, as opposed to a parallel port that transmits multiple (usually eight) bits simultaneously. RS232C is a common serial interface standard.

Service Specific Software

A program designed for a designated online service such as AOL.

Start Bit

A data bit used in asynchronous transmission to signal the beginning of the character.

Stop Bit

A data bit used in asynchronous transmission to signal the end of the character.

System Administrator

The person responsible for monitoring computer activity in a specified area, such as a company.

Synchronous Communication

A method of sending digital data in which the bits come at fixed, rather than random, times and are synchronized to a clock.

TCP/IP (Transmission Control Protocol/Internet Protocol)

The two best-know Internet protocols, often erroneously thought of as one protocol. TCP enables two hosts to establish a connection and exchange streams of data. TCP guarantees delivery of data and guarantees that packets

iR1200 Modem

will be delivered in the same order in which they were sent. IP acts as a postal system, allowing you to address a package and drop it in the system, but doesn't provide a direct link between you and the recipient. TCP/IP, on the other hand, establishes a connection between two hosts so that they can send messages back and forth for a period of time.

Terminal Mode

The mode that accepts AT commands. Also known as Command Mode. When your modem is in this mode, it is waiting to receive AT commands that you type from your communications software.

Transmission Rate

The rate at which data is transferred measured in bits per second. Common transfer rates are 9.6bps / 19200bps / 57600bps / 115200bps

UTC

Universal Time Coordinated. Uniform atomic time system/standard that is maintained by the US Naval Observatory. UTC defines the local solar mean time at the Greenwich Meridian.

UTC Offset

The difference between local time and UTC (Example: UTC – EST = 5 hours).

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